

IN THE CLAIMS:

Please amend the claims as follows:

55. (Currently Amended) A method of producing high purity ammonium dimolybdate from low grade molybdenite concentrates comprising:
- a) forming an aqueous slurry of said low grade molybdenite concentrates;
  - b) oxidizing said slurry in an atmosphere containing free oxygen at ~~a~~ a pressure of at least about 50 p.s.i. and at a temperature of at least about 200°C and thereafter producing a first discharge with greater than about 99% of the molybdenum in said low grade molybdenite concentrates oxidized and greater than about 80% of molybdenum values insoluble;
  - c) filtering said first discharge to produce a first liquid filtrate containing soluble molybdenum values and a first solid filter cake containing the insoluble molybdenum values;
  - d) leaching said first solid filter cake with an alkaline solution to produce a second discharge wherein greater than about 98% of the insoluble molybdenum values are solubilized;
  - e) filtering said second discharge to produce a second liquid filtrate and a second solid filter cake;
  - f) recovering the molybdenum values from said second liquid filtrate by solvent extraction with an organic solvent to produce a first liquor by (1) contacting said second liquid filtrate with said organic solvent to form a two-phase mixture and ~~+(2)~~ simultaneously reducing the pH level in said two-phase mixture such that the molybdenum values in said second liquid filtrate are extracted into said organic solvent; and (2) ~~(3)~~ stripping said organic solvent with aqueous ammonia to recover the molybdenum values;
  - g) crystallizing said first liquor containing the extracted molybdenum values to produce crystals and a second liquor; and
  - h) recovering said high purity ammonium dimolybdate ~~suitable as a chemical grade product~~ from said crystals.

56. (Previously Presented) The method of Claim 55, wherein the organic solvent contains a secondary amine.

57. (Currently Amended) The method of Claim 56, wherein the organic solvent contains ditridecyl amine ~~ditridecyl amine~~.

58. (Previously Presented) The method of Claim 55, wherein the reduced pH level in said two-phase mixture ranges from about 4.0 to about 4.5.

59. (Currently Amended) The method of Claim 55, wherein the reducing ~~step~~ is accomplished by adding hydrated sulfuric acid to said two-phase mixture.

60. (Currently Amended) The method of Claim 55, wherein ~~the stripping step uses~~ ammonium hydroxide is used during the stripping to recover the molybdenum values.

61. (Currently Amended) The method of Claim 55, wherein the pH level during the stripping ~~step~~ is maintained at about 9.0.

62. (Currently Amended) A method of producing high purity ammonium dimolybdate from low grade molybdenite concentrates comprising:

- a) forming an aqueous slurry of said low grade molybdenite concentrates;
- b) oxidizing said slurry in an atmosphere containing free oxygen at an pressure of at least about 50 p.s.i. and at a temperature of at least about 200°C and thereafter producing a first discharge with greater than about 99% of the molybdenum in said low grade molybdenite concentrates oxidized and greater than about 80% of molybdenum values insoluble;
- c) separating and filtering said first discharge to produce a first liquid filtrate containing soluble molybdenum values and a first solid filter cake containing the insoluble molybdenum values;
- d) leaching said first solid filter cake with an ammoniacal solution to produce a second discharge wherein greater than about 98% of the insoluble molybdenum values are solubilized;
- e) filtering said second discharge to produce a second liquid filtrate and a second solid filter cake;
- f) aging said second liquid filtrate;
- g) crystallizing said second liquid filtrate to produce crystals and a first liquor; and
- h) recovering said high purity ammonium dimolybdate ~~suitable as a chemical grade product~~ from said crystals;

wherein the method further comprises subjecting said first liquid filtrate produced in step (c) to a solvent extraction process to recover molybdenum values, said solvent extraction process comprising contacting said first liquid filtrate with an organic solvent to form a two-phase mixture, ~~instantaneously~~ and simultaneously reducing the pH level in said two-phase mixture such that the molybdenum values in said first liquid filtrate are extracted into said organic solvent, and stripping said organic solvent to produce a second liquor containing the recovered molybdenum values.

63. (Previously Presented) The method of Claim 62, wherein the organic solvent contains a secondary amine.

64. (Currently Amended) The method of Claim 63, wherein the organic solvent contains ditridecyl amine ~~ditridecyl amine~~.

65. (Previously Presented) The method of Claim 62, wherein the reduced pH level in said two-phase mixture ranges from about 4.0 to about 4.5.

66. (Currently Amended) The method of Claim 62, wherein the reducing ~~step~~ is accomplished by adding hydrated sulfuric acid to said two-phase mixture.

67. (Currently Amended) The method of Claim 62, wherein ~~the stripping step uses~~ sulfuric acid is used during the stripping to recover the molybdenum values.

68. (Currently Amended) The method of Claim 62, wherein the pH level during the stripping ~~step~~ is maintained at about less than 3.0.

69. (Previously Presented) The method of Claim 62, further comprising recycling a portion of said second liquor back to the aqueous slurry in step (a).

70. (Previously Presented) The method of Claim 62, further comprising subjecting said second liquor to a cementation process to recover copper values, said cementation process comprising adding iron to said second liquor and mixing to produce a first solution, filtering said first solution to produce a third liquid filtrate and a third solid filter cake, and then recovering said copper values from said third solid filter cake.

71. (Currently Amended) A method of producing high purity ammonium dimolybdate from low grade molybdenite concentrates comprising:

- a) forming an aqueous slurry of said low grade molybdenite concentrates;
- b) oxidizing said slurry in an atmosphere containing free oxygen at an pressure of at least about 50 p.s.i. and at a temperature of at least about 200°C and thereafter producing a first discharge with greater than about 99% of the molybdenum in said low grade molybdenite concentrates oxidized and greater than about 80% of molybdenum values insoluble;
- c) separating and filtering said first discharge to produce a first liquid filtrate containing soluble molybdenum values and a first solid filter cake containing the insoluble molybdenum values;
- d) leaching said first solid filter cake with an ammoniacal solution to produce a second discharge wherein greater than about 98% of the insoluble molybdenum values are solubilized;
- e) filtering said second discharge to produce a second liquid filtrate and a second solid filter cake;
- f) aging said second liquid filtrate and adding a reagent selected from the group consisting of iron molybdate, ammonium sulfide, sulfide compounds, and ferric sulfate to said second liquid filtrate;
- g) crystallizing said second liquid filtrate to produce crystals and a first liquor; and
- h) recovering said high purity ammonium dimolybdate ~~suitable as a chemical grade product~~ from said crystals.

72. (Currently Amended) A method of producing high purity ammonium dimolybdate from low grade molybdenite concentrates comprising:

- a) forming an aqueous slurry of said low grade molybdenite concentrates;
- b) oxidizing said slurry in an atmosphere containing free oxygen at an pressure of at least about 50 p.s.i. and at a temperature of at least about 200°C and thereafter producing a first discharge with greater than about 99% of the molybdenum in said low grade molybdenite concentrates oxidized and greater than about 80% of molybdenum values insoluble;
- c) leaching said first discharge with an alkaline solution to produce a second discharge wherein greater than about 98% of the insoluble molybdenum values are solubilized;

- d) separating and filtering said second discharge to produce a liquid filtrate containing soluble molybdenum values and a solid filter cake containing the insoluble molybdenum values;
- e) recovering the molybdenum values from said liquid filtrate by solvent extraction with an organic solvent to produce a first liquor by (1) contacting said liquid filtrate with said organic solvent to form a two-phase mixture and ~~;(2)~~ simultaneously reducing the pH level in said two-phase mixture such that the molybdenum values in said liquid filtrate are extracted into said organic solvent; and (2) ~~(3)~~ stripping said organic solvent to recover the molybdenum values;
- f) crystallizing said first liquor containing the extracted molybdenum values to produce crystals and a second liquor; and
- g) recovering said high purity ammonium dimolybdate ~~suitable as a chemical grade product~~ from said crystals.

73. (Previously added) The method of Claim 72, wherein the organic solvent contains a secondary amine.

74. (Currently Amended) The method of Claim 73, wherein the organic solvent contains ditridecyl amine ~~di, tridecyl amine~~.

75. (Previously added) The method of Claim 72, wherein the reduced pH level in said two-phase mixture ranges from about 4.0 to about 4.5.

76. (Currently Amended) The method of Claim 72, wherein the reducing ~~step~~ is accomplished by adding hydrated sulfuric acid to said two-phase mixture.

77. (Currently Amended) The method of Claim 72, wherein ammonium hydroxide is used during the stripping ~~step uses ammonium hydroxide~~ to recover the molybdenum values.

78. (Currently Amended) The method of Claim 72, wherein the pH level during the stripping ~~step~~ is maintained at about 9.0.